

SCV2007: Abstracts

2007 Midwest Workshop on Complex Analysis and Geometry

April 13-15, 2007

University of Illinois at Chicago

* Joseph J. Kohn (Princeton)

TITLE: PDE with Loss of Derivatives

ABSTRACT: See kohnabstract.pdf.

* Sidney Webster (Chicago)

TITLE: Integrability Problems for CR Manifolds

ABSTRACT: We consider the local integrability problem for connections on vector bundles over a smooth strictly pseudoconvex real hypersurface M in C^n . (This is motivated by the local CR embedding problem, for which all known methods of proof are extremely complicated, and yield very poor regularity.) We obtain (with X. Gong) solutions with very sharp regularity, avoiding the Nash–Moser techniques, but still only if $\dim(M)$ is 7 or higher.

* Charles Fefferman (Princeton)

TITLE: Whitney’s Extension Problem

ABSTRACT:

1. (Infinite flavor) Fix $m, n \geq 1$, and let $f : E \rightarrow R$ be a function on a (completely arbitrary) subset E in R^n . How can we tell whether f extends to a C^m function F on all of R^n ? If F exists, can we estimate its C^m norm? Can we take F to depend linearly on f ? What can we say about the derivatives of F at a given point?

2. (Finite flavor; joint work with Bo’az Klartag) Fix $m, n \geq 1$, and let P_1, \dots, P_N be points in $R^{(n+1)}$. How can we compute a function $F : R^n \rightarrow R$ whose graph passes through (or close to) all (or all but a few) of the P_i , such that the C^m norm of F is (almost) as small as possible?

* **Linda Rothschild (UCSD)**

TITLE: Segre mappings of real submanifolds in complex space and applications to mapping problem

ABSTRACT: In this talk I will survey some recent results concerning mappings of real submanifolds, including transversality, jet determination, and the structure of automorphism groups. The common theme will be the use of the method of Segre mappings in the proofs of these results.

* **John Erik Fornaess (Michigan)**

TITLE: Laminated currents

ABSTRACT: We discuss two possible definitions of laminated closed currents on sets laminated by Riemann surfaces. This is joint work with Yinxia Wang and Erlend Fornaess Wold

* **David Barrett (Michigan)**

TITLE: Leray transforms on two-dimensional Reinhardt domains

ABSTRACT: This talk will examine the Leray transform

$$\mathbf{L}f(w) = \frac{-1}{4\pi^2} \int_{\zeta \in bD} f(\zeta) \frac{\partial\rho(\zeta) \wedge \bar{\partial}\rho(\zeta)}{(\partial\rho(\zeta)[\zeta - w])^2}$$

on convex Reinhardt domains in \mathbf{C}^2 with an emphasis on spectral properties and duality considerations. An underlying theme will be the role of the choice of boundary measure.

The work is joint with Loredana Lanzani.

* **Mei-Chi Shaw (Notre Dame)**

TITLE: The Cauchy–Riemann equations in complex projective spaces

ABSTRACT: In this talk we discuss the Cauchy-Riemann equations in complex projective spaces. We use bounded plurisubharmonic exhaustion functions on pseudoconvex domains to study the $\bar{\partial}$ problem with weights in complex projective spaces. Global regularity for the Cauchy–Riemann equations on both pseudoconvex and pseudoconcave domains up to the boundary will be analyzed. The solutions are used to study the function theory via the $\bar{\partial}$ –Cauchy problem. We also discuss the application to the nonexistence of Lipschitz Levi–flat hypersurfaces in the complex projective space of dimension at least three, which removes the smoothness requirement used in an earlier paper of Siu (Joint work with Jianguo Cao).

* **Madhav Nori (University of Chicago)**

TITLE: Regularisation of Infinite Series and Analytic Continuation

ABSTRACT: By defining the sum of certain non absolutely convergent series, the analytic continuation of functions obtained by summing over lattices in euclidean space will be proven.

* **Salah Baouendi (UCSD)**

TITLE: Transversality of Holomorphic Mappings Between Real Hypersurfaces in Different Dimensions

ABSTRACT: We consider holomorphic mappings between real hypersurfaces in different dimensional complex spaces. We give a number of conditions that imply that such mappings are transversal to the target hypersurface at most points.

* **Yum-Tong Siu (Harvard)**

TITLE: Multiplier Ideal Sheaves in Analysis and Algebraic Geometry

ABSTRACT: We will discuss the techniques of multiplier ideal sheaves in analysis and algebraic geometry, their applications to problems in algebraic geometry, recent results, and open problems.

* **John P. D'Angelo (UIUC)**

TITLE: Positivity Conditions for Hermitian Symmetric Functions

ABSTRACT: I will introduce various positivity conditions for Hermitian symmetric functions, discuss the relationships among them, and give some applications to complex geometry.